# 10/539033

## JC17 Rec'd PCT/PTO 11 JUN 2005

Attorney's Docket: 2002DE.143

#### Amendments to the Claims

- 1. (Currently Amended) A method for the production of a phthalocyanine pigment preparation, said method-comprising the steps of finely dividing a crude phthalocyanine pigment by means of a method selected from the group consisting of dry grinding, wet grinding, salt kneading, acid pasting and acid swelling to form a prepigment and then-subjecting the prepigment to a finish treatment in a mixture of water and an organic solvent at alkaline pH, at elevated temperature and in the presence of at least one pigment dispersant selected from the group consisting of phthalocyaninesulfonic acids, phthalocyaninecarboxylic acids, phthalocyaninesulfonic salts, phthalocyaninecarboxylic salts and phthalocyaninesulfonamides.
- 2. (Currently Amended) The method as claimed in claim 1, wherein the <u>crude</u> phthalocyanine <u>pigment</u> is halogen-free or is substituted by up to 16 halogen atoms.
- 3. (Currently Amended) The method as claimed in claim 1-or-2, wherein the <u>crude</u> phthalocyanine <u>pigment</u> is a copper phthalocyanine.
- 4. (Currently Amended) The method as claimed in-one-or-more of claims 1 to 3 claim 1, wherein the organic solvent of the finish treatment is a solvent\_is selected from the group consisting of C<sub>1</sub>-C<sub>10</sub> alcohols, glycols, polyglycols, ethers, glycol ethers, ketones, aliphatic acid amides, urea derivatives, cyclic carboxamides, nitriles, aliphatic or-amines, aromatic amines, chlorinated aliphatic hydocarbons, aromatic hydrocarbons, substituted aromatics, aromatic heterocycles, sulfones and sulfoxides, and mixtures thereof.
- 5. (Currently Amended) The method as claimed in one or more of claims 1 to 4claim 1, wherein the finish treatment is carried out at a pH of greater than or equal to 9.

- 6. (Currently Amended) The method as claimed in one or more of claims 1 to 5claim 1, wherein the weight ratio of water to organic solvent is 5:95 to 95:5.
- 7. (Currently Amended) The method as claimed in one or more of claims 1 to 6claim 1, wherein 0.5 to 40 parts by weight of the mixture of water and organic solvent are used per part by weight of crude phthalocyanine pigment.
- 8. (Currently Amended) The method as claimed in one or more of claims 1 to 7-claim 1, wherein the finish treatment is carried out at a temperature of 50 to 250°C.
- 9. (Currently Amended) The method as claimed in one or more of claims 1 to 8claim 1, wherein the pigment dispersant is a compound of the formula (I)

### in which wherein

- is a phthalocyanine radical which is either metal-free or contains a metal atom selected from the group consisting of Cu, Fe, Zn, Ni, Co, Al, Ti erand Sn, especially Cu, and which wherein the phthalocyanine radical is substituted by 1 to 4 chlorine atoms or preferably is chlorine-free;
- m and n are identical or different and are a number from 0 to 4 with the proviso that the sum of m and n is a number from 1 to 4;

and in which wherein the radical Z<sup>1</sup> is a radical of the formula (Ia)

$$-N$$
 (la)

in which wherein the two radicals Z<sup>2</sup> are identical or different and are a radical of the formula (Ib)

$$-[X-Y]_h-R^3 \qquad (Ib)$$

#### in whichwherein

- h is a number from 0 to 100, preferably 0 to 20, more preferably 0, 1, 2, 3, 4 or 5;
- is a C<sub>2</sub>-C<sub>6</sub> alkylene radical, C<sub>5</sub>-C<sub>7</sub> cycloalkylene radical, or a combination ef these radicals, it being possible for these radicals to be thereof, wherein the C<sub>2</sub>-C<sub>5</sub> alkylene radical, C<sub>5</sub>-C<sub>7</sub> cycloalkylene radical, or combination thereof is, optionally, substituted by 1 to 4 C<sub>1</sub>-C<sub>4</sub> alkyl radicals, hydroxyl radicals, C<sub>1</sub>-C<sub>4</sub> alkoxy radicals, (C<sub>1</sub>-C<sub>4</sub>)-hydroxyalkyl radicals, and/or by 1 to 2 further C<sub>5</sub>-C<sub>7</sub> cycloalkyl radicals, or in which X, if h is > 1, the C<sub>2</sub>-C<sub>5</sub> alkylene radical, C<sub>5</sub>-C<sub>7</sub> cycloalkylene radical, or combination thereof is, optionally, substituted by a combination 1 to 4 C<sub>1</sub>-C<sub>4</sub> alkyl radicals, hydroxyl radicals, C<sub>1</sub>-C<sub>4</sub> alkoxy radicals, (C<sub>1</sub>-C<sub>4</sub>)-hydroxyalkyl radicals, or 1 to 2 further C<sub>5</sub>-C<sub>7</sub> cycloalkyl radicals can also be a combination of the stated definitions;

Y is an -O-, 
$$-N$$
 or a group -NR<sup>2</sup>-,

or in which wherein Y, if h > 1, can also be a combination of the stated definitions is, optionally, a combination of

R² and R³ independently of one another are a hydrogen atom, a substituted or unsubstituted, or partly fluorinated or perfluorinated, branched or unbranched C<sub>1</sub>-C<sub>20</sub> alkyl group, a substituted or unsubstituted C<sub>5</sub>-C<sub>8</sub> cycloalkyl group or a substituted or unsubstituted, or partly fluorinated or perfluorinated C<sub>2</sub>-C<sub>20</sub> alkenyl group, it being possible for the substituents to be hydroxyl, phenyl,

cyano, chlorine, bromine, amino,  $C_2$ - $C_4$  acyl or  $C_4$ - $C_4$  alkoxy and to be preferably 1 to 4 in number, or

R<sup>2</sup> and R<sup>3</sup> together with the nitrogen atom of the NR<sup>2</sup> group form a saturated, unsaturated or aromatic heterocyclic 5- to 7-membered ring which if desired centains-optionally containing 1 or 2 further nitrogen, oxygen or sulfur atoms or carbonyl groups in the ring, is-wherein the saturated, unsaturated or aromatic heterocyclic 5- to 7-membered ring is unsubstituted or substituted by 1, 2 or 3 radicals selected from the group consisting of OH, NH<sub>2</sub>, phenyl, CN, Cl, Br, C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>2</sub>-C<sub>4</sub> acyl and carbamoyl, and, optionally, if desired-carries 1 or 2 benzo-fused saturated, unsaturated or aromatic, carbocyclic or heterocyclic rings;

or Z²

G

is hydrogen, hydroxyl, amino, phenyl, (C<sub>1</sub>-C<sub>4</sub>)-alkylene-phenyl, C<sub>5</sub>-C<sub>30</sub> cycloalkyl, C<sub>2</sub>-C<sub>30</sub> alkenyl, or is branched or unbranched C<sub>1</sub>-C<sub>30</sub> alkyl, it being possible for wherein the phenyl, -ring, the (C1-C4)-alkylene-phenyl, -group, the C<sub>5</sub>-C<sub>30</sub> cycloalkyl-group, the-C<sub>2</sub>-C<sub>30</sub> alkenyl group and or the C<sub>1</sub>-C<sub>30</sub> alkyl group to be is, optionally substituted by one or more, e.g., 1, 2, 3 or 4, substituents selected from the group consisting of Cl, Br, CN, NH<sub>2</sub>, OH, C<sub>6</sub>H<sub>5</sub>, C<sub>6</sub>H<sub>5</sub> substituted by 1, 2 or 3 C<sub>1</sub>-C<sub>20</sub> alkoxy radicals, carbamoyl, carboxyl, C<sub>2</sub>-C<sub>4</sub> acyl, C<sub>1</sub>-C<sub>8</sub> alkyl, NR<sup>2</sup>R<sup>3</sup>, where R<sup>2</sup> and R<sup>3</sup> are as defined above, and C<sub>1</sub>-C<sub>4</sub> alkoxy, e.g, methoxy or ethoxy, or for wherein the C1-C30 alkyl group and or the C<sub>2</sub>-C<sub>30</sub> alkenyl group to be is perfluorinated or partly fluorinated; is a divalent group -CO-, -SO<sub>2</sub>-, -SO<sub>2</sub>N(R<sup>6</sup>)-R<sup>5</sup>-CO-, -SO<sub>2</sub>N(R<sup>6</sup>)-R<sup>5</sup>-SO<sub>2</sub>-, -CON(R<sup>6</sup>)-R<sup>5</sup>-CO- or -CON(R<sup>6</sup>)-R<sup>5</sup>-SO<sub>2</sub>-, and R<sup>5</sup> is a divalent branched or unbranched, saturated or unsaturated, aliphatic hydrocarbon radical having 1 to 20 carbon atoms, or a C<sub>5</sub>-C<sub>7</sub> cycloalkylene radical, or a divalent aromatic radical having 1, 2 or 3, preferably 1 or 2, aromatic rings, it being possible ferwherein, optionally, the 1, 2 or 3 aromatic rings to beare in fused form or to beare linked by a bond, such as, for example, a phenyl, biphenyl or naphthyl radical, or a heterocyclic radical having 1, 2 or 3 rings and containing 1, 2, 3 or 4 heteroatoms from the group O, N and S, or is a combination thereof;

wherein the aforementioned-aliphatic hydrocarbon, cycloalkylene, aromatic and heteroaromatic radicals ean beare, optionally, substituted by 1, 2, 3 or 4 substituents selected from the group consisting of OH, CN, F, CI, Br, NO<sub>2</sub>, CF<sub>3</sub>, C<sub>1</sub>-C<sub>6</sub> alkoxy, S-C<sub>1</sub>-C<sub>6</sub> alkyl, NHCONH<sub>2</sub>, NHC(NH)NH<sub>2</sub>, NHCO-C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkyl, COOR<sup>20</sup>, CONR<sup>20</sup>R<sup>21</sup>, NR<sup>20</sup>R<sup>21</sup>, SO<sub>3</sub>R<sup>20</sup> er-and SO<sub>2</sub>-NR<sup>20</sup>R<sup>21</sup>, R<sup>20</sup> and R<sup>21</sup> being identical or different and being hydrogen, phenyl or C<sub>1</sub>-C<sub>6</sub> alkyl, and R<sup>6</sup> is hydrogen, R<sup>5</sup>-H, R<sup>5</sup>-COO-E+ or R<sup>5</sup>-SO<sub>3</sub>-E+; and

- is H<sup>+</sup>; the equivalent M<sup>s+</sup>/s of a metal cation M<sup>s+</sup>, preferably from main groups 1 to 5 or from transition groups 1 or 2 or 4 to 8 of the Periodic Table of the Chemical Elements, s being one of the numbers 1, 2 or 3; a phosphonium ion; or an unsubstituted or substituted ammonium ion.
- 10. (Currently Amended) The method as claimed in one or more of claims 1 to 9claim 1, wherein the at least one pigment dispersant is used in an amount of 0.1% to 25% by weight, based on the crude phthalocyanine pigment.
- 11. (Currently Amended) The method as claimed in one of more of claims 1 to 10claim 1, wherein the mixture further comprises at least one auxiliary selected additionally auxiliaries are used from the group consisting of surfactants, nonpigmentary dispersants, and pigmentary dispersants, fillers, standardizers, resins, waxes, defoamers, antidust agents, extenders, shading colorants, preservatives, drying retarders, rheology control additives, wetting agents, antioxidants, UV absorbers, light stabilizers, or a combination and mixtures thereof.
- 12. (New) The method as claimed in claim 9, wherein the metal atom is Cu.
- 13. (New) The method as claimed in claim 9, wherein the phthalocyanine radical is chlorine-free.
- 14. (New) The method as claimed in claim 9, wherein h is from 0 to 20.

Attorney's Docket: 2002DE.143

- 15. (New) The method as claimed in claim 9, wherein h is 0, 1, 2, 3, 4 or 5.
- 16. (New) The method as claimed in claim 9, wherein at least one of  $R^2$  and  $R^3$  are substituted by hydroxyl, phenyl, cyano, chlorine, bromine, amino,  $C_2$ - $C_4$  acyl or  $C_1$ - $C_4$  alkoxy, and wherein the number of substitutions is 1 to 4.
- 17. (New) The method as claimed in claim 9, wherein the  $C_1$ - $C_4$  alkoxy is methoxy or ethoxy.
- 18. (New) The method as claimed in claim 9, wherein the 1, 2, or 3 aromatic rings are linked by a bond selected from the group consisting of phenyl, biphenyl, naphthyl radical, and a heterocyclic radical having 1, 2 or 3 rings and containing 1, 2, 3 or 4 heteroatoms selected from the group consisting of O, N and S, or a mixture thereof.
- 19. (New) The method as claimed in claim 9, wherein the metal cation M<sup>s+</sup> is selected from main groups 1 to 5 or from transition groups 1 or 2 or 4 to 8 of the Periodic Table of the Chemical Elements.
- 20. (New) A phthalocyanine pigment preparation made in accordance with the method as claimed in claim 1.
- 21. (New) A colorant composition comprising a phthalocyanine pigment preparation as claimed in claim 20.
- 22. (New) The colorant composition as claimed in claim 21, wherein the colorant composition is an electrophotographic toner, electrophotographic developer, or an ink.
- 23. (New) A high molecular weight organic material comprising a phthalocyanine pigment preparation as claimed in claim 20.

Attorney's Docket: 2002DE.143

24. (New) The high molecular weight organic material as claimed in claim 23, wherein the high molecular weight organic material is selected from the group consisting of plastics, resins, varnishes, paints, electrophotographic toners, electrophotographic developers and inks.